

REMARKS

This Amendment responds to the Office Action dated July 21, 2005 in which the Examiner objected to claims 24-25 and rejected claims 6-29 under 35 U.S.C. §103.

Applicants respectfully request the Examiner acknowledge the Information Disclosure Statement filed August 3, 2005.

As indicated above, a minor informality in claims 24 and 25 have been corrected. Therefore, Applicants respectfully request the Examiner withdraws the objection to claims 24 and 25.

As indicated above, claims 6, 11, and 17 have been amended to make explicit what is implicit in the claim. The amendment is unrelated to a statutory requirement for patentability.

Claim 6 claims an image pick-up device comprising a sensor, a setting unit, and a correction unit. The sensor picks up an image through a lens. The setting unit sets chromatic aberration factors based on the image data picked up from a predetermined pattern. The predetermined pattern is a ladder pattern of vertical lines, each one of which is present for every n pixels of said sensor, wherein $1 \leq n \leq M/2$ is satisfied for n when M is the total pixel number of the sensor. The correction unit corrects image data picked up from an original image by using the chromatic aberration factors set by the setting unit.

Through the structure of the claimed invention having a ladder pattern of vertical lines, each one of which is present for every n pixels of the sensor, wherein $1 \leq n \leq M/2$ is satisfied for n when M is the total pixel number of the sensor as claimed in claim 6, the claimed invention provides an image pick-up device which can output

stable color image information signals which are not influenced by chromatic aberration. The prior art does not show, teach or suggest the invention as claimed in claim 6.

Claim 11 claims an image pick-up device comprising a sensor, a pattern image, a calculation unit, a memory and a correction unit. The sensor picks up an image through a lens. The pattern image has a predetermined pattern that is a ladder pattern of vertical lines, each one of which is present for every n pixels of the sensor, wherein $1 \leq n \leq M/2$ is satisfied for n when M is the total pixel number of the sensor. The calculation unit calculates chromatic aberration factors based on the image data picked up from the pattern image. The memory stores the calculated chromatic aberration factors. The correction unit corrects image data picked up from an original image based on the stored chromatic aberration factors.

Through the structure of the claimed invention having a ladder pattern of vertical lines, each one of which is present for every n pixels of a sensor, wherein $1 \leq n \leq M/2$ is satisfied for n when M is the total pixel number of the sensor, as claimed in claim 11, the claimed invention provides an image pick-up device which can output stable color image information while not being influenced by chromatic aberrations. The prior art does not show, teach or suggest the invention as claimed in claim 11.

Claim 17 claims an image pick-up device comprising a sensor, a pattern image, a determining unit, a setting unit and a correction unit. The sensor picks up an image through a lens. The pattern image has a predetermined pattern that is a ladder pattern of vertical lines, each one of which is present for every n pixels of a sensor, wherein $1 \leq n \leq M/2$ is satisfied for n when M is the total pixel number of the

sensor. The determining unit determines a character amount of the image data picked up from the pattern image. The setting unit sets chromatic aberration factors based on the character amount. The correction unit corrects image data picked up from an original image by using the chromatic aberration factors set by the setting unit.

Through the structure of the claimed invention having a ladder pattern of vertical lines, each one of which is present for every n pixels of a sensor, wherein $1 \leq n \leq M/2$ is satisfied for n when M is the total pixel number of the sensor, as claimed in claim 17, the claimed invention provides an image pick-up device which can output a stable color image information signal which is not influenced by chromatic aberration. The prior art does not show, teach or suggest the invention as claimed in claim 17.

Claims 6-29 were rejected under 35 U.S.C. §103 as being unpatentable over *Komiya et al.* (U.S. Patent No. 6,097,430) in view of *Kobayashi* (U.S. Patent No. 5,414,536).

Komiya et al appears to disclose an image processing apparatus for obtaining a broader-range photograph by photographing a subject image in a plurality of divided parts and joining or composing together part-images. (col. 1, lines 6-9) FIG. 15 shows an arrangement for calculating a correction values. The arrangement comprises a photographing camera 43 equivalent to that shown in FIG. 12, a sheet 47 for aberration detection which is placed on a stand bottom plate 46, a memory card 23 for recording image information on the sheet 47 for photographed aberration detection, a card reader 25 for reading out image information on the memory card 23, a data expanding section 30 for data-expanding the image information, an RGB

converting section 31 for converting the information to RGB signals, an aberration correction value calculation section 48 for calculation correction values, a_1 , a_2 corresponding to the focal length of header information and distortion aberration from lens position information, for aberration correction, and a distortion aberration correction table 27 for recording calculated correction values, a_1 , a_2 . In the image processing apparatus, the aberration detection sheet 47 is imaged by the photographing camera 43 and corresponding image information is stored in the memory card 23. The image information in the memory card 23 is read out of the card reader 25. After being data-expanded by the data-expanding section 30, the image information is converted to RGB signals by means of the RGB converting section 31. Then the signals are supplied to the aberration correction value calculating section 48 where correction values, a_1 , a_2 , are calculated. These correction values are written in the distortion aberration table 27 at those predetermined addresses determined by the focal length and lens position. It is possible to perform compose processing with the use of the distortion aberration table 27 above. According to the present embodiment, images are taken with a cross mark in FIG. 16 displayed at a finder and centered at the nine solid dots and, by so doing, it is possible to enhance the accuracy with which the aberration is calculated. As the sheet 47 for aberration detection use may be made of not only the aberration detection sheet 47 as shown in FIG. 14A but also a grid-like pattern sheet such as graph paper. (col. 12, lines 5-49)

Thus, *Komiya et al.* merely discloses in Fig. 14A a nine dot pattern. However, nothing in *Komiya et al.* shows, teaches or suggests a ladder pattern of vertical lines, each one of which is present for every n pixels of a sensor, wherein $1 \leq n \leq M/2$ is

satisfied for n when M is the total pixel number of the sensor as claimed in claim 6, 11 and 17. Rather, *Komiya et al.* merely discloses a dot pattern.

Kobayashi appears to disclose image readers of the type in which the image of an original text is formed on a linear image sensor by means of an optical imaging system (col. 1, lines 9-12). An imaging performance assessment pattern 50 is placed along the field angle direction of the optical imaging system (scanning direction of image sensor shown by the arrow B in FIG. 3) in a portion of the platen 23 which is not used for the text 22. The imaging performance assessment pattern 50 used in this embodiment is a cyclic and alternate arrangement of a ladder pattern 51 of 41p (line pair)/mm parallel to the field angle direction of the optical imaging system and a ladder pattern 52 of 41p (line pair)/mm perpendicular to the field angle direction, as shown in FIG. 5 (col. 4, lines 40-50).

Applicant respectfully traverses the Examiner's rejection by *Kobayashi*. In particular, Applicant respectfully points out the column 4, line 35 of the patent is a misprint and does not state $P=8\text{mm}$ of the CCD image sensor 41 as suggested by the Examiner. Attached to this response is a copy of the Japanese Laid Open Patent Application No. HEI 6-46260 which is the base patent application of the *Kobayashi* reference. As shown in this reference, $P=8\text{ }\mu\text{m}$ at column 4, line 35 of the U.S. Patent should in fact read $P=8\text{ }\mu\text{m}$ with reference to paragraph 0014 of the Laid Open application. Additionally, "a ladder pattern 52 of 41p (line pair)/mm" in column 4, line 49 of *Kobayashi* should in fact read "4 lp (line pair)/mm" with reference to paragraph 0015 of the Laid Open Patent Application No. HEI 6-46260.

Thus, in *Kobayashi*, each vertical line of the ladder pattern is present for every $25\text{ }\mu\text{m}$ ($1/4\text{mm}$) while a pixel pitch of the CCD sensor is $8\text{ }\mu\text{m}$. Therefore, about three

vertical lines are present for every one pixel in the *Kobayashi* reference. Thus, nothing in *Kobayashi* shows, teaches or suggest a ladder pattern of vertical lines, each one of which is present for every n pixels of the sensor, wherein $1 \leq n \leq M/2$ is satisfied for n when M is the total pixel number of the sensor as claimed in claim 6, 11 and 17.

Since nothing in *Komiya et al.* or *Kobayashi* show, teach or suggest a ladder pattern of vertical lines, each one of which is present for every n pixels of a sensor, wherein $1 \leq n \leq M/2$ is satisfied for n when M is the total pixel number of the sensor as claimed in claim 6, 11 and 17, Applicants respectfully request the Examiner withdraws the rejection to claims 6, 11 and 17 under 35 U.S.C. §103.

Claims 7-10, 12-16 and 18-29 depend from claim 6, 11 and 17 and recite additional features. Applicants respectfully submit that claims 7-10, 12-16 and 18-29 would not have been obvious within the meaning of 35 U.S.C. §103 over *Komiya et al.* and *Kobayashi* at least for the reasons as set forth above. Therefore, Applicants respectfully request the Examiner withdraws the rejection to claims 7-10, 12-16 and 18-29 under 35 U.S.C. §103.

Thus it now appears that the application is in condition for reconsideration and allowance. Reconsideration and allowance at an early date are respectfully requested.

If for any reason the Examiner feels that the application is not now in condition for allowance, the Examiner is requested to contact, by telephone, the Applicants' undersigned attorney at the indicated telephone number to arrange for an interview to expedite the disposition of this case.

In the event that this paper is not timely filed within the currently set shortened statutory period, Applicants respectfully petition for an appropriate extension of time. The fees for such extension of time may be charged to our Deposit Account No. 02-4800.

In the event that any additional fees are due with this paper, please charge our Deposit Account No. 02-4800.

Respectfully submitted,

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